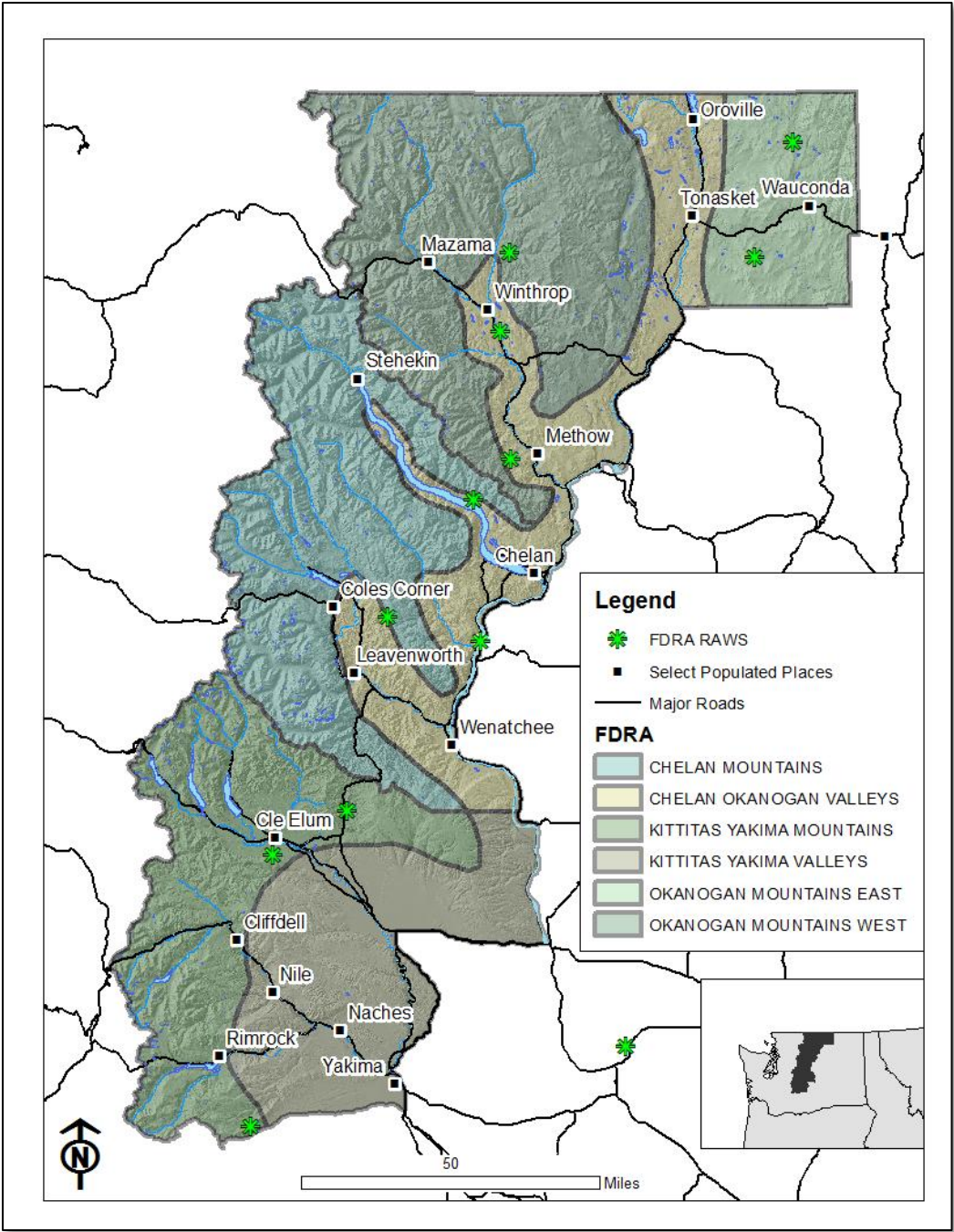


Central Washington Fire Danger Operating Plan

2015



Signatures

Okanogan Wenatchee Forest Supervisor

Date

CWICC Center Manager

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Okanogan Wenatchee Fire Staff Officer

Date

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I. Introduction

This plan is intended to document an operational planning and decision making process for agency administrators, fire managers, dispatchers and firefighters in Central Washington. The process used to develop this plan is consistent with what is taught in the National Wildfire Coordinating Group courses and is based upon available scientific methods incorporating historical fire and weather analysis.

The development process generally involves:

1. Acquire and quality control historic weather and fire history data.
2. Delineate Fire Danger Rating Areas based on vegetation, climate and topography.
3. Assign historic fire history and weather data to fire danger rating areas.
4. Perform analysis for statistical correlation of historic fire occurrence with historic NFDRS outputs by FDRA and identify basis for future decisions.
5. Develop decision thresholds based on the NFDRS outputs and historic fire occurrence that best matches the intent of the decision.
6. Document the analysis, operation, communication, and maintenance re-evaluation process in a Fire Danger Operating Plan.

On July 6, 1994, the South Canyon Fire resulted in the deaths of 14 firefighters in Colorado. In 1995, an Interagency Management Review Team for the South Canyon Fire charged the National Advisory Group for Fire Danger Rating with developing an implementation plan to improve technical transfer of fire danger technology. On July 10, 2001, four firefighters lost their lives on the Thirtymile Fire in Washington. The Thirtymile tragedy prompted an Accident Prevention Plan which contained specific actions to enhance firefighter safety, including the need to identify thresholds for critical fuels and weather conditions that lead to extreme burning conditions and publishing these on pocket cards for use by firefighters. On July 22, 2003, two firefighters lost their lives in the Cramer Fire in central Idaho. OSHA levied serious violations which included the failure to recognize fire danger thresholds for large fires and respond accordingly. In addition, a remote automated weather station (RAWS) near the fire had not received maintenance and calibration before the start of the fire season. This plan addresses action items identified in these tragic fires by providing the direction necessary to convey fire danger awareness to fire management personnel of escalating fire potential.

Guidance and policy for development of a Fire Danger Operating Plan can be found in the Interagency Standards for Fire & Aviation Operations (Red Book), Wildland Fire and Aviation Program and Management and Operation Guide (Blue Book), and Forest Service Manual 5120.

A. Administrative Unit

This plan encompasses approximately 6.8 million acres in central Washington covering portions of Okanogan, Chelan, Kittitas, and Yakima counties. The plan boundary, also referred to as the analysis area, is based upon the 2013 Okanogan Wenatchee National Forest Primary Wildland Fire Protection Area. Within the plan area the Okanogan Wenatchee National Forest has primary protection responsibility for approximately 4.0 million acres of federal lands including Bureau of Land Management and US Fish and Wildlife lands. The Washington State Department of Natural Resources, local and county fire districts, provides protection on the remaining 2.8 million acres.

Suppression resources within the plan area are dispatched out of the Central Washington Interagency Communications Center. Central Washington Interagency Communications Center tracks and assigns Okanogan Wenatchee National Forest and Washington State Department of Natural Resources personnel to initial attack incidents based on closest forces; as such federal initial attack response is not limited based on ownership boundaries.

The Columbia Basin Fire Danger Operating Plan and the Northeast Washington Fire Danger Operating Plan lie adjacent and to the east of this fire danger plan¹. Currently there are no formal Fire Danger Operating Plan Fire Danger Rating Areas identified to the west of the Cascade crest.

B. Objectives

1. Provide a tool for agency administrators, fire managers, dispatcher, agency cooperators and firefighters to correlate fire danger ratings with appropriate fire business decisions.
2. Delineate fire danger rating areas with similar climate, vegetation and topography.
3. Establish and maintain an interagency fire weather monitoring network consisting of Remote Automated Weather Stations which comply with National Fire Danger Rating System standards (PMS 426-3).
4. Determine fire business thresholds using the Weather Information System, National Fire Danger Rating System and Fire Family Plus software through analysis of an integrated database of historical fire weather and fire occurrence data.
5. Define roles and responsibilities to make fire preparedness decisions, manage weather information, manage weather stations, and brief fire personnel regarding current and potential fire danger.
6. Develop and distribute fire danger pocket cards to all personnel involved with fire suppression activities within the plan area.
7. Identify program needs and suggest improvements for the plan.

¹ Consideration should be given to combining this plan with the Columbia Basin plan as both are within Central Washington Interagency Communications Center Response area.

II. Fire Danger Inventory

A. Fire Danger Rating Area Development

A Fire Danger Rating Area is defined as: “A geographic area relatively homogenous in climate, fuels and topography, tens of thousands of acres in size, within which the fire danger can be assumed to be uniform. Its size and shape is primarily based on influences of fire danger, not political boundaries. It is the basic on-the-ground unit for which unique fire management decisions are made based on fire danger ratings. Weather is represented by one or more National Fire Danger Rating System weather stations.” (National Fire Danger Working Group, 2002)

An analysis of the central Washington plan area was completed using ESRI ArcGIS and spatial data sourced from various locations. Data used for analysis was developed consistently across the analysis area. Data analyzed includes; 30-meter Digital Elevation Model (DEM), NFDRS Slope Class (DEM derived), Fire Behavior Fuel Models (LANDFIRE), Level III Eco regions (Bailey), Climate Class (Thorntwaite, 1948), and climate data produced by the PRISM Climate Group (Oregon State University); including 30 year normalized average annual precipitation and 30 year normalized average annual maximum temperature spanning 1981-2010.²

Initial delineation efforts focused on separating the two major vegetation types, mesic upland forest and lowland xeric forest, savannah, sage and grass. Elevation, fuels, and climate data were then classed and delineated with deference given to the delineation that generally fell closest to the vegetation break. While examining overlaid delineations National Weather Service Fire Weather Zone boundaries were determined to be an acceptable north to south interpolation.³ This resulted in 3 initial Fire Danger Rating Areas (East Slope Cascade Mountains, Western Okanogan Highlands, and Okanogan Columbia Valleys) that could be broadly classed into 2 general divisions (Mountains and Valleys).

A desire to further reduce Rating Area size along with differences in topography, fire business, climate, and vegetation led to additional divisions along Chelan-Kittitas and Chelan-Okanogan county lines, major hydrologic divides. The break along the Chelan and Okanogan valleys at the county line was later removed after further analysis of fire business showed combining to be beneficial⁴.

An analysis of Weather Station 10 year average 1-hour time lag fuel moisture observations (Fosberg, 1973) was also considered during the development of Fire Danger Rating Areas and association of Remote Automated Weather Stations.

At this time Fire Danger Rating Area boundaries have not been snapped to Dispatch Response Area Boundaries, on the recommendation of Central Washington Interagency Communications Center personnel due to anticipated changes and functionality related to technological advances in the forthcoming release of WildCad 6.0 due in 2014.

Additional details of the Fire Danger Rating Area analysis and development can be found in the Appendices Section D.

² PRISM data is available by month, data for July and August were examined to see if the relative difference between annual and monthly was sufficient to warrant GIS raster processing to create fire season normalized data, it did not appear to be.

³ The analyst was generally satisfied with the use of the fire weather zone boundary with the exception of the western boundary of zone 680, moving this boundary to the east is worth a look for the next revision.

⁴ The boundary could be added back in for purposes of separating North and South DNR regions.

B. Fire Danger Rating Area Descriptions

Table 1: Fire Danger Rating Area selected spatial statistics.

FDRA	Acres	Federal Ownership	Mean Elevation	Median Slope Class	Timber Fuel Model
Okanogan Mountains East	536,058	41%	3,759	1	44%
Okanogan Mountains West	1,534,946	80%	4,981	2	62%
Chelan Mountains	1,354,712	94%	4,706	3	71%
Kittitas-Yakima Mountains	1,176,535	72%	4,195	2	79%
Chelan-Okanogan Valleys	1,226,893	28%	2,111	1	22%
Kittitas-Yakima Valleys	1,005,927	11%	2,641	1	19%

FDRA	Mean Precipitation	Mean Temperature	Median Climate Class
Okanogan Mountains East	18	52	1
Okanogan Mountains West	33	48	2
Chelan Mountains	54	49	4
Kittitas-Yakima Mountains	56	50	3
Chelan-Okanogan Valleys	17	58	1
Kittitas-Yakima Valleys	21	57	1

Okanogan Mountains West, Chelan Mountains, Kittitas-Yakima Mountains (East Slope Cascade Mountains)

These Fire Danger Rating Areas cover the east slope of the Cascade Mountains from the Cascade Crest downslope to the point where forest cover becomes limited by moisture/aspect. They are characterized by relatively extreme differences in climate and vegetation from west to east along an elevation gradient and more subtle differences from north to south. The majority of lands within these Rating Areas are forested and federally owned.

Reasons for further subdivision of the East Slope Cascades area include; a desire to reduce the rating area to less than 4-million acres, align with WA Department of Natural Resources regions for purposes of facilitating industrial and public restrictions (north DNR and south DNR), separate counties with a unique fire problem (human caused fires in Kittitas and Yakima counties), and separate based on unique climate (Okanogan county is drier and colder) and topography (Chelan county is steeper).

Chelan-Okanogan Valleys, Kittitas-Yakima Valleys (Okanogan and Columbia Valleys)

The Valley Fire Danger Rating Areas represent the Okanogan and Columbia River breaks country; including the lower portions of major tributaries such as the Methow, Chelan, Entiat, Wenatchee, Yakima, and Tieton. The Valleys are dominated by brush and grass but also include xeric forest cover on north and northeast aspects. Federal ownership is minimal. North to south difference in climate, topography, and vegetation within the Valley Rating Areas are minimal.

Reasons for further subdivision of the Valleys include fire problem (human caused fires in Kittitas and Yakima) and a desire to reduce Rating Area size.

Okanogan Mountains East (Western Okanogan Highlands)

This Fire Danger Rating Area represents the Western Okanogan Highlands, geologically more closely related to the Rocky Mountains than the Cascades. Precipitation and slope class in this Rating Area are more similar to the Valley Rating Areas (dry and rolling) while elevation and temperature are more similar to the East Slope Cascade Mountain Rating Areas (cold and high). Federal ownership and forested vegetation cover less than half of the area, however a significant portion of the privately owned land which would likely support forest cover has been converted to agricultural use.

C. Fire Occurrence

Interagency fire occurrence records for this analysis were obtained from the Fire Program Analysis Fire Occurrence Database (Short, 2013). “The data product contains a spatial data base of wildfires that occurred in the United States from 1992-2011, generated for the national Fire Program Analysis system. The wildfire records were acquired from the reporting systems of federal, state and local fire organizations and local fire organizations. Basic error checking was performed and redundant records were identified and removed to the degree possible.”

Fire points were assigned a Fire Danger Rating Area based on the location of the fire origin. Fires prior to 1998 were removed based on a lack of consistent quality weather data available for analysis for the period. Statistical cause codes from the Fire Program Analysis Fire Occurrence Database were

reassigned where necessary for import into Fire Family Plus.

For the period 1998-2011 there has been an average of 306 wildfires per year with an average annual acreage burned of 53,850 acres for the combined wildfire agencies in the central Washington area. The minimum number of fires in a year was 196 in 2011 and the minimum acres burned were 3,931 in the same year. The maximum number of fires was 507 in 2009 and the maximum number of acres burned was 249,436 in 2006.

63% of fires occur in July and August, 20% of fires occur in June and September and 11% in May and October. 46% of fires are caused by lightning. 96% of fires are controlled at 100 acres or less with 98% controlled at less than 1,000 acres.

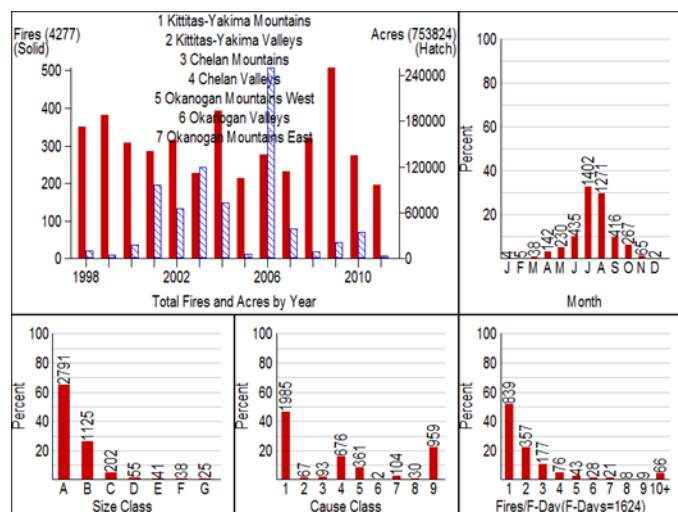


Figure 1: Fire Danger Operating Plan interagency fire history, 1998-2011

Table 2: Fire Danger Rating Area selected summary fire history statistics.

INITIAL ATTACK FAILURE PERCENT, 1998-2011				PERCENTILE FIRE SIZE (ACRES), 1998-2011			
FDRA	C+	D+	E+	FDRA	95th	97th	98th
Okanogan Mountains East	7%	3%	1%	Okanogan Mountains East	15	40	114
Okanogan Mountains West	6%	3%	2%	Okanogan Mountains West	20	82	298
Chelan Mountains	9%	5%	4%	Chelan Mountains	93	542	1150
Kittitas-Yakima Mountains	4%	3%	1%	Kittitas-Yakima Mountains	5	38	120
Chelan-Okanogan Valleys	13%	5%	3%	Chelan-Okanogan Valleys	83	400	741
Kittitas-Yakima Valleys	11%	5%	2%	Kittitas-Yakima Valleys	100	210	358

FIRE OCCURRENCE AND PERCENT HUMAN CAUSED, 1998-2011		
FDRA	# Fires	% Human
Okanogan Mountains East	463	43%
Okanogan Mountains West	838	26%
Chelan Mountains	633	40%
Kittitas-Yakima Mountains	955	75%
Chelan-Okanogan Valleys	947	56%
Kittitas-Yakima Valleys	447	84%

A detailed set of comparative fire history graphs can be found in the Appendices Section D.

D. Weather

Weather Data

Historic weather observations from the Weather Information Management System were retrieved for Weather Stations within and adjacent to the plan area and were examined for quality and completeness for the period of interest (fire season) using Fire Family Plus software. In most cases data prior to 1998 lacked quality sufficient for fire business analysis. Obvious outliers were examined and corrected where presumed to be erroneous. Data gaps were not filled in for the purposes of this analysis. A more complete quality control process could be completed for the subsequent analysis and revision.⁵

Remote Automated Weather Stations

In 2013 there are a total of 18 permanent active Remote Automated Weather Stations within the Central Washington plan area. Stations with less than 90% data completeness from May through October were removed from further consideration for National Fire Danger System Rating purposes. These include Aeneas (60%), Stehiken (83%) and Viewpoint (82%). Monument 83 was removed from consideration due to its relocation in 2013 because of access issues (now Slate Mountain); the new location was deemed too different to attach historic weather to the new location. Entiat weather station was also moved in 2013 due to the construction of a parking lot nearby; the plan is to carry historic weather forward to the new location. An additional Remote Automated Weather Station east of the plan area (Saddle Mountain) is also used for fire business analysis and decision making in this plan.

Station details can be found in the Appendices in Section D.

Special Interest Groups

Special Interest Groups were developed using the geographical process described above in section II in combination with an analysis of station 1-hour time lag fuel moisture (Fosberg, 1973). These stations groups were used as a starting point for the fire business analysis process described in Section III below.

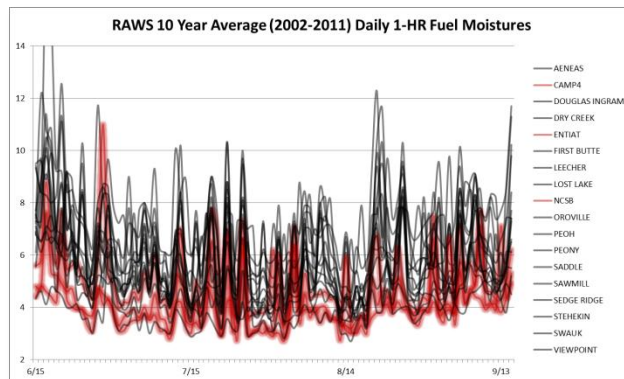


Figure 2: Weather station ten year average daily one-hour time lag fuel moistures. Chelan Okanogan Valley SIG station traces are highlighted.

Generally, once a best fit fuel model and indices were determined an iterative process of testing stations within groups was used to find the best station combination within a rating area. The best fit station combination, fuel model and indices were then tested against stations in adjacent Special Interest Groups to see if there was a significant statistical contribution. Special Interest Groups resulting from that process are as follows can be found below in Section III.

⁵ Seamless historic weather data from the Western Regional Climate Center is currently available which has been developed based on the digital weather grid. The data remains difficult to obtain at this time but should be considered for future revisions.

III. Fire Business Analysis

A. Process

Fire business thresholds are values of one or more fire weather/fire danger indices that have been statistically related to occurrence of fires (fire business). Generally, the threshold defines a range of fire weather/fire danger values where fire activity has significantly increased or decreased. Fire business thresholds more closely predict fire activity than climatological breakpoints.

A comprehensive Fire Family Plus analysis of historic weather and fire occurrence was completed using the fire history data described in section II B above and weather data described in II D to find the combination of station(s), indices and fuel model that had the best statistical goodness of fit to the fire problem using a logistic regression model. Fire Day and Large Fire Day goodness of fit were the primary considerations; Multi Fire Day was examined but not a significant driver in final selection. Large fire day fit was given the most consideration with large fire size defined by historic rating area percentile fire size, generally around the 97th percentile.

The following general analysis process was used for each Fire Danger Rating Area:

1. Spatial climate, vegetation, topography and historical weather data were used to combine weather stations into Rating Areas used as a starting point for testing possible combinations of indices and National Fire Danger Rating System fuel models against historical fire business for Goodness of Fit.
2. Best fit combinations of indices and fuel model were then tested against different combinations of stations within and adjacent to individual Fire Danger Rating Areas.
3. Best fit combinations of station, indices, and fuel model were then re tested against other top ranking indices and fuel model combinations from step 1.
4. Adjacent Fire Danger Rating Areas were combined to examine statistical results.⁶
5. Station groups and Fire Danger Rating Areas resulting from the above process were then used develop thresholds for 5 classes of fire danger and fire business.

B. Settings

The following parameters were used for analysis in Fire Family Plus. Settings were based on the spatial and weather data analysis discussed in Section III and an analysis of recent year catalog green up dates in the Weather Information Management System.

Table 3: Settings used in the Fire Family Plus analysis process.

FDRA	YEARS	MONTH DAY	GREEN UP	SLOPE CLASS	CLIMATE CLASS	GRASS
<i>Okanogan Mountains East</i>	1998-2011	5/01-10/31	5/15	1	2	PERENNIAL
<i>Okanogan Mountains West</i>	1998-2011	5/01-10/31	5/15	2	3	PERENNIAL
<i>Chelan Mountains</i>	1998-2011	5/01-10/31	5/15	3	3	PERENNIAL
<i>Kittitas-Yakima Mountains</i>	1998-2011	5/01-10/31	5/15	2	4	PERENNIAL
<i>Chelan-Okanogan Valleys</i>	1998-2011	4/01-10/31	4/15	1	2	PERENNIAL
<i>Kittitas-Yakima Valleys</i>	2002-2011	4/01-10/31	4/15	1	1	PERENNIAL

⁶ The Okanogan Mountain East Fire Danger Rating Area was combined and tested with the North rating area from the Northeast Washington plan, combination was not statistically favorable. Chelan Valleys and Chelan-Okanogan Valleys were combined and tested with the South rating area from the Northeast plan, combination was not statistically favorable. The Kittitas-Yakima Valleys were not tested with the adjacent Columbia Basin rating area as data was not immediately available.

C. Special Interest Groups (SIGS)

The following groups of Remote Automated Weather Stations and associated historical weather observations consistently had the best fit to historical fire business and will be tested as Fire Danger Rating Area Special Interest Groups in 2014 and 2015.

Table 4: Special Interest Groups resulting from the Fire Family Plus analysis process.

FDRA	NWS ID	STN NAME	WEIGHT
<i>Okanogan Mountains East</i>	452029	Lost Lake	1.0
	452038	Peony	1.0
<i>Okanogan Mountains West</i>	452006	First Butte	1.0
	452035	Douglas Ingram	1.0
<i>Chelan Mountains</i>	452134	Dry Creek	1.0
	452035	Douglas Ingram	1.0
<i>Kittitas-Yakima Mountains</i>	452206	Peoh Point	1.0
	452219	Swauk	1.0
	452036	Sedge Ridge	1.0
<i>Chelan-Okanogan Valleys</i>	452030	NCSB	1.0
	452132	Camp 4	1.0
	452136	Entiat	1.0
<i>Kittitas-Yakima Valleys</i>	452701	Saddle Mountain	1.0
	452219	Swauk	1.0

D. Results

Goodness of Fit results from the statistical analysis. Chi squared values less than 13 are considered an excellent fit for this regression model (8 degrees of freedom); P values are associated with Chi squared, greater than .05 indicate a good Chi squared fit. R (L) squared values closer to 1 are better (1.0 is a perfect fit). Probability range was also considered in this analysis. Energy Release Component was consistently the statistically best matched indices to Large Fire Day occurrence across all rating areas.

Table 5: Statistical results and settings from the Fire Family Plus analysis process.

FDRA	LARGE FIRE AC	INDICES-MODEL	FIRE DAY FIT RESULTS			LARGE FIRE DAY FIT RESULTS		
			CHI SQ	P VALUE	R (L) SQ	CHI SQ	P VALUE	R (L) SQ
<i>Okanogan Mountains East</i>	100	ERC-H	12.8	0.1174	0.63	6.1	0.4123	0.64
<i>Okanogan Mountains West</i>	100	ERC-H	8.6	0.3768	0.87	4.8	0.7784	0.78
<i>Chelan Mountains</i>	100	ERC-H	5.4	0.7173	0.95	1	0.9982	0.93
<i>Kittitas-Yakima Mountains</i>	100	ERC-U	6.2	0.6296	0.96	6	0.6494	0.67
<i>Chelan-Okanogan Valleys</i>	100	ERC-H	6	0.6504	0.93	5.7	0.6814	0.77
<i>Kittitas-Yakima Valleys</i>	200	ERC-U	12	0.1496	0.81	2.4	0.8826	0.87

Table 6: Staffing Level breaks.

FDRA	1	2	3	4	5
Okanogan Mountains East	0	10	20	30	38
Okanogan Mountains West	0	11	24	35	44
Chelan Mountains	0	12	22	34	41
Kittitas-Yakima Mountains	0	12	23	33	41
Chelan-Okanogan Valleys	0	15	24	32	41
Kittitas-Yakima Valleys	0	17	27	36	43

Table 7: Staffing Level breakdown of Energy Release Component class breaks, Historical Statistics, and Model Outputs.

FDRA	CLASS	RANGE	% FIRE SEASON	MODEL PROB FD	MODEL PROB LFD	% HISTORIC LFD
Okanogan Mountains East, ERC-H, LFD = 100	1	0-9	16	6-8	0-0	0
	2	10-19	18	8-9	0-0	0
	3	20-29	27	10-12	0-1	10
	4	30-37	20	12-14	2-5	30
	5	38+	18	14-19	6-33	60
FDRA	CLASS	RANGE	% FIRE SEASON	MODEL PROB FD	MODEL PROB LFD	% HISTORIC LFD
Okanogan Mountains West, ERC-H, LFD = 100	1	0-10	12	6-8	0-0	0
	2	11-23	20	9-12	0-1	0
	3	24-34	26	13-17	1-2	10
	4	35-43	27	17-21	3-8	28
	5	44+	16	22-29	9-33	62
FDRA	CLASS	RANGE	% FIRE SEASON	MODEL PROB FD	MODEL PROB LFD	% HISTORIC LFD
Chelan Mountains, ERC-H, LFD = 100	1	0-11	11	3-6	0-1	0
	2	12-21	16	6-9	1-2	0
	3	22-33	29	9-15	2-5	10
	4	34-40	24	15-20	6-9	28
	5	41+	20	21-32	10-26	62
FDRA	CLASS	RANGE	% FIRE SEASON	MODEL PROB FD	MODEL PROB LFD	% HISTORIC LFD
Kittitas-Yakima Mountains, ERC-U, LFD = 100	1	0-11	10	6-10	0-0	0
	2	12-22	21	11-17	0-1	0
	3	23-32	28	18-26	1-2	17
	4	33-40	25	27-35	2-5	26
	5	41+	16	36-52	6-19	57
FDRA	CLASS	RANGE	% FIRE SEASON	MODEL PROB FD	MODEL PROB LFD	% HISTORIC LFD
Chelan-Okanogan Valleys, ERC-H, LFD = 100	1	0-14	9	7-11	0-1	0
	2	15-23	16	11-14	1-2	0
	3	24-31	23	15-19	2-4	8
	4	32-40	30	19-24	4-8	32
	5	41+	21	25-34	9-24	61
FDRA	CLASS	RANGE	% FIRE SEASON	MODEL PROB FD	MODEL PROB LFD	% HISTORIC LFD
Kittitas-Yakima Valleys, ERC- U, LFD = 200	1	0-16	11	2-5	0-0	0
	2	17-26	23	6-9	0-0	0
	3	27-35	32	9-13	0-2	8
	4	36-42	22	14-18	3-8	33
	5	43+	12	19-28	10-44	58

IV. Fire Danger Based Decisions

The National Fire Danger Rating System utilizes the Weather Information Management System processor to manipulate weather data stored in the National Interagency Fire Management Integrated Database producing fire danger outputs for Remote Automated Weather Station Special Interest Groups which represent Fire Danger Rating Areas defined in this plan. The system is designed to calculate worst-case scenario fire danger for the Rating Area.

National Fire Danger Rating System outputs will be utilized in the following ways for the purpose of this plan. The **Staffing Level**, computed by Fire Danger Rating Area will; assist agency resources maintain awareness regarding daily potential for large fire growth and help personnel at the sub-unit level (district/division) determine an appropriate state of readiness. The **Preparedness Level**, an aggregate of the Staffing Levels within the Okanogan Wenatchee primary suppression response area, will help agency personnel determine an appropriate state of readiness of at the unit level (Forest/Communications Center). The **Dispatch Level**, a function of Staffing Level and computed by Rating Area, is a decision tool for dispatchers to assign initial attack resources to reported fires. The Staffing Level and subsequent derivations are based on fire business thresholds, Special Interest Groups, indices, and components, described above in Section III.

Thresholds, indices, and components for Industrial and Public entities are not currently directly addressed in this plan.

A. Staffing Level

Staffing Level can be thought of as readiness level where the fire danger continuum is divided into classes to which management actions can be tied. Staffing Level classes also provide insight to where on the fire danger continuum you are today. Staffing Levels are traditionally expressed as numeric values where 1 represents the low end of the fire danger continuum and 5 represents the high end. Staffing Level represents a way of linking fire danger information to fire management decisions.

Staffing Level in this plan is based on the best fit indices for Large Fire Days, which for all Rating Areas is Energy Release Component. Staffing Level will be used; as a communication tool to inform fire response personnel of the daily potential for Large Fire occurrence [Fire Danger], to provide Line Officers and Fire Managers guidance for fire business decisions, and to provide an aggregate level of readiness as a starting point for determining Preparedness Level. For clarity when broadcast, Staffing Level will be expressed as a numeric value plus a descriptive value representing Fire Danger, “1-Low”. This is not the same as the Adjective Rating calculated by the Weather Information Management System which is based on Climatological Breakpoints and is not used in this plan.

	FDRA STAFFING LEVEL & FIRE DANGER				
	1-L	2-M	3-H	4-VH	5-E
FDRA SIG	ENERGY RELEASE COMPONENT				
OKANOGAN MOUNTAINS EAST	0-9	10-19	20-29	30-37	38+
OKANOGAN MOUNTAINS WEST	0-10	11-23	24-34	35-43	44+
CHELAN MOUNTAINS	0-11	12-21	22-33	34-40	41+
KITTITAS YAKIMA MOUNTAINS	0-11	12-22	23-32	33-40	41+
CHELAN OKANOGAN VALLEYS	0-14	15-23	24-31	32-40	41+
KITTITAS YAKIMA VALLEYS	0-16	17-26	27-35	36-42	43+

Figure 3: Staffing Levels

RESPONSIBLE PARTY	SUGGESTED ACTIONS	STAFFING LEVEL				
		1-L	2-M	3-H	4-VH	5-E
District/Zone Fire Management Officer	Assure IA personnel are briefed on SL, PL, local burning conditions, and availability of IA resources	○	○	○	○	○
	Consider requesting an aerial detection flight		○	○	○	○
	Evaluate the need for restrictions, closures, and patrols			○	○	○
	Consider requesting extended staffing				○	○
	Consider requesting additional staffing					○

Figure 4: Staffing Level Suggested Actions

B. Dispatch Level

Dispatch Level represents a way of linking fire danger information to a preplanned response to reported incidents. Logic says that the higher the fire danger the more personnel and equipment will be needed to contain a new fire. Central Washington Interagency Communications Center uses a three tiered run-card system within WildCad to assign resources to emerging incidents until an Incident Commander arrives on scene and establishes command.

Dispatch Level in this plan is a function of Staffing Level and based on the Energy Release Component since it has the best statistical fit to Large Fire Day occurrence. Dispatch Level will be used to send resources commensurate with the potential for Large Fires to emerging incidents and to inform Incident Commanders of what resources they can expect to be in route to the incident on a given day. In order to distinguish it from Staffing Level it will be expressed as a color when broadcast, "Yellow".

Run Cards are maintained by, and can be found on file with, the Central Washington Interagency Communications Center.

	FDRA DISPATCH LEVEL		
	1	2	3
FDRA SIG	ENERGY RELEASE COMPONENT		
OKANOGAN MOUNTAINS EAST	0-29	30-37	38+
OKANOGAN MOUNTAINS WEST	0-34	35-43	44+
CHELAN MOUNTAINS	0-33	34-40	41+
KITTITAS YAKIMA MOUNTAINS	0-32	33-40	41+
CHELAN OKANOGAN VALLEYS	0-31	32-39	40+
KITTITAS YAKIMA VALLEYS	0-35	36-42	43+

Figure 5: Dispatch Levels

C. Okanogan Wenatchee National Forest Preparedness Level

Forest Preparedness Levels are established by the **Forest Fire Staff Officer** during fire season, generally May through October. Preparedness Levels identify actions to be taken or curtailed by the Forest Fire Staff Officer and Central Washington Interagency Coordination Center to ensure an appropriate level of response.

Preparedness Levels are dictated by aggregate Staffing Level, the Northwest Coordination Center Seven Day Significant Fire Potential Outlook product (<http://www.nwccweb.us/predict/outlook.aspx>), and resource availability/commitment. Situations and activities described within the Preparedness Levels consider wildland and prescribed fire activity.



OWF RESPONSE AREA STAFFING LEVEL MEDIAN	2		3		4		5	
(1) ✓ ⇨								
NWCC 7 DAY SIGNIFICANT FIRE POTENTIAL OUTLOOK*	No	Yes	No	Yes	No	Yes	No	Yes
(2)✓ ⇨								
RESOURCES COMMITTED**		No	Yes	No	Yes	No	Yes	
(3)✓ ⇨								
OWF PREPAREDNESS LEVEL	II		III		IV		V	
*NWCC 7 DAY SIGNIFICANT FIRE POTENTIAL OUTLOOK	A FEN of Elevated or High in the 7 Day Outlook in either PSA NW05 or NW08 will trigger a Yes; http://www.nwccweb.us/predict/outlook.aspx							
**RESOURCES COMMITTED	Majority of IA resources and numerous overhead off the forest							

Figure 6: Preparedness Level Worksheet

PREPAREDNESS LEVEL	DESCRIPTION
I	Aggregate response area fire danger is low, historically ~5% of fire days occur under these conditions and there has been no Large Fire occurrence. NWCC fire potential is null or if potential exists then significant resource commitment is null.
II	Aggregate response area fire danger is moderate, historically ~15% of fire days occur under these conditions and there has been no Large Fire occurrence. NWCC fire potential is null and significant resources are committed or NWCC fire potential exists and resources are available.
III	Aggregate response area fire danger is high, historically ~10% of Large Fire Days have occurred under these conditions. NWCC fire potential is null and significant resources are committed or NWCC fire potential exists and resources are available.
IV	Aggregate response area fire danger is very high, historically ~30% of Large Fire Days have occurred under these conditions. NWCC fire potential is null and significant resources are committed or NWCC fire potential exists and resources are available.
V	Aggregate response area fire danger is very extreme, historically ~60% of Large Fire Days have occurred under these conditions. NWCC fire potential exists or significant resources are committed.

Figure 7: Preparedness Level Description

RESPONSIBLE PARTY	SUGGESTED ACTIONS	PREPAREDNESS LEVEL				
		I	II	III	IV	V
Forest Duty Officer	Identify District Fire Managers		○	○	○	○
	3 or more Modules are on Forest	○	○			
	7 or more Modules are on Forest			○	○	○
	Review regional and national PL's and evaluate Rx fire activities			○	○	○
	Consider aerial detection flights			○	○	○
	Consider holding/ordering additional resources if <i>current fire activity</i> is significant			○	○	○
	Consider holding/ordering additional resources if at the minimum draw down level or based on <i>predicted fire activity</i>				○	○
	Consider the need for closures/restrictions				○	○
	Ensure the PAO has initiated media contacts and public notifications				○	○
	Consider pre positioning an IMT					○
	Consider a fire severity request if no ABC					○

Figure 8: Forest Duty Officer Preparedness Actions. For draw down purposes a Module is defined as an Engine staffed with at least 3 personnel or a 5 person squad with leadership.

RESPONSIBLE PARTY	SUGGESTED ACTIONS	PREPAREDNESS LEVEL				
		I	II	III	IV	V
Communications Center Manager	Ensure that SL, DL, and PL are calculated, broadcast, and posted daily in fire season	○	○	○	○	○
	Consult with OWF FMO concerning potential for extended staffing beyond normal shift length or days			○	○	○
	Consult with NWCC regarding availability of resources in the GACC				○	○
	Consider pre-positioning or detailing of off-unit IA dispatchers and logistics support personnel					○

Figure 9: Communication Center Manager Preparedness Actions

RESPONSIBLE PARTY	SUGGESTED ACTIONS	PREPAREDNESS LEVEL				
		I	II	III	IV	V
Agency Administrator	Ensure Resource Advisors are designated and available			○	○	○
	Issue guidance to Forest Staff regarding the severity of the season and increased need for available fire support personnel				○	○
	Consider the need for closures/restrictions and discuss with Forest FMO					○

Figure 10: Agency Administrator Preparedness Actions

V. Operational Procedures

A. Weather Information Management System (WIMS)

Seasonal Schedule

The **Communications Center** Lead Intelligence Dispatcher will coordinate with the Fire Weather Station Managers (**District Fire Management Officers**) to set green-up. Annual cycle would be; begin entering observations ~1 month prior to green-up, pre-green stations ~2 weeks prior to green-up, green-up stations ~2 weeks prior to the peak of greenness, freeze stations after 3 consecutive days of minimum temperatures less than 28 degrees Fahrenheit (>09/01).

Communications Center Lead Intelligence should monitor Normalized Difference Vegetation Index satellite imagery found on the Wildland Fire Assessment System (WFAS), <http://maps.wfas.net/> and initiate annual contacts with Station Managers if needed as peak green up approaches. Station Managers will make the final decision when to set the herbaceous state to green. Stations within Fire Danger Rating Areas should be greened individually if appropriate.

Appropriate thousand-hour startup values should be considered on an annual basis, the same site used to monitor greenness can also be used to enter 1000-hr startup values (<http://maps.wfas.net/>).

Table 8: Weather Information System approximate seasonal management schedule for National Fire Danger Rating System stations.

FDRA	APPROXIMATE DATE	TASK
Valley (NCSB, Camp4, Entiat, Saddle Mountain)	15-Mar	Begin entering Daily Obs, determine if start up values are appropriate
	1-Apr	Pre-green all stations
	15-Apr	Green-up individual stations as indicated by NDVI and Station Manager
	1-Sep or later, 3 or more consecutive days of min temps less than 28F	Freeze individual stations as indicated by Obs and Station Manager
Mountain (Lost Lake, Peony, Douglas-Ingram, Dry Creek, Peoh Point, Swauk, Sedge)	15-Apr	Begin entering Daily Obs, determine if start up values are appropriate
	1-May	Pre-green all stations
	15-May	Green-up individual stations as indicated by NDVI and Station Manager
	1-Sep or later, 3 or more consecutive days of min temps less than 28F	Freeze individual stations as indicated by Obs and Station Manager

Daily Schedule

Intelligence personnel at the **Communications Center** will access the Weather Information Management System (WIMS) daily and;

1. **Quality Control Station Data;** weather readings for the previous 24 hours will be checked by looking at hourly observations for abnormal or inappropriate readings. Notify Station Owners of suspect or missing readings.
2. **Enter Observations;** all Observations will be for the hourly record closest to 1300 hours. For stations that transmit later than 30 minutes after the hour a 1200 record should be used. State of the Weather will be based on 1400 conditions for the majority of the Fire Danger Rating Area, not necessarily just the station. The Wet Flag will be set when appropriate based on the latest Tech Note or Help Desk guidance. Observations should be entered no later than 1500 daily so that they are available to the National Weather Service for forecasting.
3. **Fire Danger Daily Product;** Station Observations, NFDR Observations, Station Forecast, and NFDR Forecast will be loaded daily into an spreadsheet using the XML function from WIMS. The spreadsheet will calculate Staffing and Dispatch Level as well as update the fire danger charts and Observation/Forecast tables. Tables and charts will be posted to the Communications Center website as a document or image file.
4. **Briefing;** Staffing Level, Dispatch Level, and Preparedness Level should be communicated daily with the morning fire weather forecast during fire season, generally May through October.

Station Catalog Settings

The following represents ideal station catalog settings based on geospatial and fire business analysis completed. Keetch-Byram Drought Index startup values were not considered for this plan.

Table 9: Optimum settings for use in Weather Information System station catalogs.

FDRA	NWS ID	STN NAME	OWNER	HERBACEOUS	SLOPE CLASS	CLIMATE CLASS	FUEL MODEL
Okanogan Mountains East	452029	Lost Lake	USFS	P	1	2	H
	452038	Peony	USFS	P	1	2	H
Okanogan Mountains West	452006	First Butte	USFS	P	2	3	H
	452035	Douglas Ingram	USFS	P	2	3	H
Chelan Mountains	452134	Dry Creek	USFS	P	2	3	H
	452035	Douglas Ingram	USFS	P	3	3	H
Kittitas-Yakima Mountains	452206	Peoh Point	STATE	P	2	4	U
	452219	Swauk	USFS	P	2	4	U
	452036	Sedge Ridge	STATE	P	2	4	U
Chelan-Okanogan Valleys	452030	NCSB	USFS	P	1	2	H
	452132	Camp 4	USFS	P	1	2	H
	452136	Entiat	USFS	P	1	2	H
Kittitas-Yakima Valleys	452701	Saddle Mountain	FWS	P	1	1	U
	452219	Swauk	USFS	P	1	1	U

B. Okanogan Wenatchee Forest Preparedness Level Worksheet

Central Washington Interagency **Communications Center** will calculate and document a Forest Staffing Level on Sunday based on the Forest Preparedness Level Worksheet. Results will be emailed to the Forest Duty Officer who will determine if adjustments are necessary. If changes are necessary the Duty Officer will inform Central Washington Interagency Communications Center of the change.

VI. Roles and Responsibilities

Roles and responsibilities concerning the management and proper care of the National Fire Danger Rating System including; Remote Automated Fire Weather Stations, the Weather Information Management System, and the Wildland Fire Management Information system. Additional roles and responsibilities concerning application of Fire Danger outputs are listed in Section V.

A. NFDRS Program Managers

Each agency participating in the plan identifies a Program Manager. The Program Managers will use this Fire Danger Operating Plan and Fire Danger outputs as a tool to coordinate resources and to make informed fire management decisions. The Program Manager is ultimately responsible for ensuring that this plan is maintained, utilized, understood, and communicated.

Program Managers are:

- Okanogan Wenatchee National Forest – **Forest Fire Management Officer**

B. Fire Weather Station Managers

Each participating agency will identify a Field Operations Manager. Responsibilities of the Field Operations Managers include:

- Appropriate site selection and placement of fire weather stations, maintenance, and assurance that accurate observations are taken and transmitted. This includes assuring appropriate response to station malfunctions. *Visual checks of data on a frequent basis (preferably daily), will be done to ensure that station readings are reflective of actual conditions.*
- Notifying the Data Manager when erroneous or suspect data is transmitted.
- Identifying Field Operations Managers.
- Assuring Field Operations Managers are available at the local unit to perform routine station maintenance, including documentation in the Wildland Fire Management Information system, and to respond to emergency breakdowns in a timely manner. Assure that time and funds are available to complete the required training.
- Annually determine transition dates for live fuels (green-up) and notify the Data Manager to make changes within Weather Information Management System.
- Assuring that their resources are aware of and understand National Fire Danger Rating System outputs and that pocket cards are distributed to all local and incoming resources.

Fire Weather Station Managers are:

- Okanogan Wenatchee National Forest – **District Fire Management Officer**
 - District Fire Management Officers will be responsible for Forest Service Fire Weather Stations within their unit. District Fire Management Officers will identify Primary and Alternate Field Operations Managers (First Responders). Primaries will be on the local unit, Alternates may be from adjoining units. Zoned Fire Management Officers may choose to nominate a single Primary and Alternate for the Division.

C. Field Operations Managers

Field Operations Managers are delegated by Fire Weather Station Managers and are responsible for the physical maintenance of the station and associated documentation including;

- Performing annual station maintenance and responding to system failures in a timely manner, documenting station visits and pertinent information in the Wildland Fire Management Information system and providing a status report to the Weather Station Manager.
- Ensuring that the station is physically secure and that the site is maintained to standards.
- Ensuring availability during the field season to respond to problems and designating an alternate when unavailable.

Primary Field Operations Managers are:

- Okanogan Wenatchee National Forest – **Assistant Fire Management Officer, Suppression** (AFMO) or the **Fire Operations Specialist** (FOS)
 - Tonasket District (Lost Lake, Peony) - AFMO
 - Methow District (NCSB, First Butte, Douglas-Ingram, *Leecher, Slate Mountain*) - AFMO
 - Entiat & Chelan District (Camp4, Entiat) - FOS
 - Wenatchee District (Dry Creek, *Viewpoint*) - FOS
 - Cle Elum District (Swauk) - AFMO
 - Naches District (*Sawmill*) - AFMO

D. Data Manager

Central Washington Interagency Communications Center provides dispatch service within the Fire Danger Operating Plan area. The **Intelligence** unit within the Coordination Center is responsible for the operation and maintenance of the Weather Information Managements System and is delegated Data Manager. Responsibilities include:

- Ensuring that daily weather observations are edited as needed and published, preferably no later than 1600 hours.
- Monitoring data to ensure quality. This includes scanning the prior 24 hours of observations and reporting missing or suspicious data to the Station Manager. Periodically checking the observations database to make sure that all observations have been edited for calculations. Working with Station Managers to fill data gaps, fix known bad data, and submit corrections to the FAMWEB helpdesk for application to the Weather Information Management System database.
- Making station level adjustments as requested by Station Managers to live fuels and recalculating indices as needed.
- Disseminating Fire Danger information to include calculating, broadcasting, and posting daily indices and trends, updating and posting Fire Danger Charts, and posting Restrictions and Closures to the website.
- Update fire danger pocket cards on a bi annual base, submit for approval, and post to the Communications Center website.

E. Duty Officers

Participating agency Duty Officers are responsible for coordinating with appropriate staff and other agency duty officers to evaluate if fire danger indices are appropriate and adjusting fire business accordingly.

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References

- Gaining an Understanding of NFDRS <http://www.nwccg.gov/pms/pubs/MasterGaining.pdf>
- WIMS XML Tech Note (Fire Danger Product) https://fam.nwccg.gov/fam-web/WIMS_Technote_2013-02-WXML.pdf
- WA DNR IFPL http://www.dnr.wa.gov/RecreationEducation/Topics/FireBurningRegulations/Pages/rp_fire_ifpl.aspx.aspx
- NWCC 7 Day Outlook <http://www.nwccweb.us/predict/outlook.aspx>

Appendices

A. Okanogan Wenatchee Forest Fire Restriction and Closure Communication Plan – Public and Industrial

This action plan will be used to implement or cancel fire restrictions or closures on the Okanogan Wenatchee National Forest. Key to the plan is the Forest Fire Group conference call conducted each Monday during fire season. By the following day, Tuesday, all restrictions and closures will be implemented allowing time to implement the plan in advance of the weekend. This includes giving notice to cooperators, landowners, and the public. It also allows an opportunity for units to change fire danger signs and organize prevention patrols.

Internal Action Plan - Interagency Contacts

During fire season, in preparation for the Monday morning conference call, each **District/Division Fire Management Officer** will evaluate National Fire Danger Rating (NFDRS) outputs and coordinate with their fire cooperators regarding perspectives on public use restrictions.

During the call the group will discuss current fire danger, anticipated trends, and interagency partner perspectives resulting in decisions for the week regarding public use restrictions. **District/Division Fire Management Officers** will be responsible for notification to staff employees on the local unit including the front desk.

The **Forest Fire Prevention Officer** will have the fire restriction orders signed by the Forest Supervisor on or before Tuesday and will notify the Public Affairs Officer. After the fire restriction order is signed the Forest Fire Prevention Officer sends orders and terminations electronically, to those listed in the Restriction and Closure Communication Contacts below.

- pdl r6 okawen pangborn fam
- pdl r6 okawen pa
- pdl r6 okawen frontliners
- pdl r6 okawen fmo
- PAOs at Mount Baker Snoqualmie, Colville, Gifford Pinchot
- RO Mitigation and Education Specialist
- debbie.robinson@wadnr.gov
- jim.duck@wadnr.gov

External Action Plan - General Public, Landowners, Cooperators

During fire season, by the Wednesday following the conference call the **Forest Public Affairs Officer**; sends notifications, posts restrictions on the forest website, and includes restrictions in the Recreation Report. The Public Affairs Officer will be responsible for communications with affected political offices and the public including maintenance and annual updates of County Commissioner/Political Office and Media Key Contact Lists.

The **Forest Fire Prevention Officer** will notify adjacent cooperators and landowners. Contacts are updated annually and can be found in the Restriction and Closure Communication Contacts list found in the Appendices.

The **District/Division Line Officer** will assure that; key local contacts (Fire Districts, sale operators, permit tee, contractors, resorts and camps, campground hosts, local businesses, utilities, etc.) are made and tracked and that a District Key Contacts list is updated annually. The Line Officer assures press releases and media contacts are coordinated through the Forest Public Affairs Officer, Restrictions and Closures are posted, phone messages updated, and related information is made available to the public.

Central Washington Interagency Communications Center will post restrictions on their website.

B. Industrial Fire Precaution Level

Washington State Department of Natural Resources sets the Industrial Fire Precaution Level according to Shutdown Zones. Changes in Precaution Level are coordinated in fire season between the State and the Forest during the Monday Fire Group call. Generally the Forest Service moves in conjunction with the States decisions.

The DNR, US Forest Service, Bureau of Land Management, and Bureau of Indian Affairs all use the same four-level industrial regulation system. This system, which helps prevent wildfires by regulating work in the woods, is known as the Industrial Fire Precaution Level (IFPL) system. The Industrial Fire Precaution Levels are (Washington State Department of Natural Resources, 2013):

- I) Closed season - Fire precaution requirements are in effect. A fire watch/security is required at this and all higher levels unless otherwise waived.
- II) Partial hootowl – The following may operate only between the hours of 8 p.m. and 1 p.m. local time:
 - Power saws except at loading sites;
 - Cable yarding;
 - Blasting;
 - Welding or cutting of metal.
- III) Partial shutdown – The following are prohibited except as indicated:
 - Cable yarding - except that gravity operated logging systems employing non-motorized carriages or approved motorized carriages may operate between 8 p.m. and 1 p.m. when all block and moving lines, except for the line between the carriage and the chokers, are suspended ten feet above the ground;
 - Power saws - except power saws may be used at loading sites and on tractor/skidder operations between the hours of 8 p.m. and 1 p.m. local time. In addition, the following are permitted to operate between the hours of 8 p.m. and 1 p.m. local time:
 - Tractor, skidder, feller-buncher, forwarder, or shovel logging operations where tractors, skidders, or other equipment with a blade capable of constructing fireline, are immediately available to quickly reach and effectively attack a fire start;
 - Mechanized loading and hauling of any product or material;
 - Blasting;
 - Welding or cutting of metal.
- IV) General shutdown – All operations are prohibited.

The following definitions shall apply to these industrial fire precaution levels:

- a. "Loading sites" means a place where any product or material, including but not limited to logs, firewood, slash, soil, rock, poles, posts, etc., is placed in or upon a truck or other vehicle.
- b. "Cable yarding systems" means a yarding system employing cables and winches in a fixed position.
- c. "Approved motorized carriages" means a cable yarding system employing a motorized carriage with two fire extinguishers, each with at least a 5 BC rating, mounted securely on opposite sides of the carriage, an emergency motor cutoff, and an approved exhaust system.
- d. "Low hazard area" means any area where the department has determined the combination of elements reduces the probability of fire starting and/or spreading.
- e. "Closed season" is that season of the year when a fire hazard exists as declared by the department or other responsible agency.

Operation: Power Saws			
Precaution Level	Landing	Tractor/Skidder	Other Woods Saws
I. Closed Season	Fire Watch	Fire Watch	Fire Watch
II. Partial Hootowl	Fire Watch	Hootowl	Hootowl
III. Partial Shutdown	Hootowl	Hootowl	Prohibited
IV. General Shutdown	Prohibited	Prohibited	Prohibited
Operation: Yarding			
Precaution Level	Tractor/skidder	Cable ¹ (gravity systems)	Cable (other systems)
I. Closed Season	Fire Watch	Fire Watch	Fire Watch
II. Partial Hootowl	Fire Watch	Hootowl	Hootowl
III. Partial Shutdown	Hootowl	Hootowl	Prohibited
IV. General Shutdown	Prohibited	Prohibited	Prohibited
¹ Includes approved motorized carriages			
Other Operations			
Precaution Level	Loading	Blasting	Welding
I. Closed Season	Fire Watch	Fire Watch	Fire Watch
II. Partial Hootowl	Fire Watch	Hootowl	Hootowl
III. Partial Shutdown	Hootowl	Hootowl	Hootowl
IV. General Shutdown	Prohibited	Prohibited	Prohibited

Where hauling involves transit through more than one shutdown/regulated use area, the precaution level at the woods loading site shall govern the level of haul restriction, unless otherwise prohibited by other than the industrial precaution level system.

The purpose of the fire watch is to stay after the day's work is over and report any fire starts to the proper authorities. The fire watch is required to be on duty after the last power-driven equipment used by the operator has been shut down for the day. The fire watch must be on duty a minimum of one hour. A fire watch must;

- Visually observe all parts of the operation area on which industrial activity has been in progress,
- Be physically capable of fighting a fire and experienced in operating fire-fighting equipment,
- Have on-site communication (CB radio, cellular or radio phone) to summon in the event a fire breaks out,
- Transportation available in case radio or phone communication doesn't work.

Industrial Fire Precaution Level Reference Pocket Cards, Brochures, Guides, Maps, and up to date closure information can be found through the Washington Department of Natural Resources website, currently located at:

http://www.dnr.wa.gov/RecreationEducation/Topics/FireBurningRegulations/Pages/rp_fire_ifpl.aspx.aspx

Okanogan-Wenatchee National Forest Industrial Fire Precaution Level Specifics

Operators wishing to continue an activity that is prohibited under an Industrial Fire Precaution Level must obtain a written waiver from the Forest Service. The Operator must initiate the request for a waiver. Waivers will be issued for a maximum of 10 days at which point it may be re issued based on revaluation of conditions and preventions measures.

Any waivers from restrictions require recommendation by the District Fire Management Officer. Waivers for Contract work are approved by the Forest Service Representative or Contracting Officer, following review by the District Ranger (at IFPL I, II, III) or the Forest Supervisor (at IFPL IV). Waivers for Force Account work are approved by the District Ranger (at IFPL I, II or III), or by the Forest Supervisor (at IFPL IV) following review by the District Ranger.

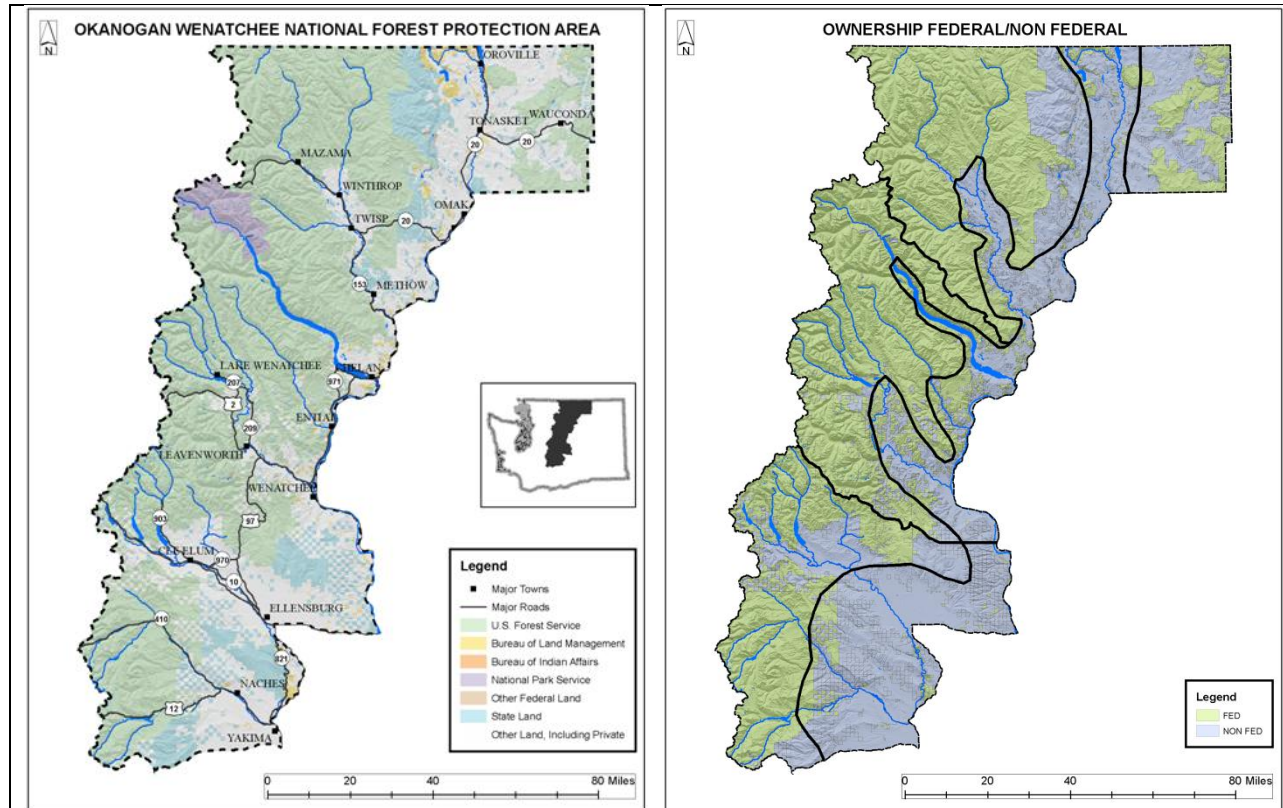
C. Public Use Restrictions

Okanogan Wenatchee National Forest Public Use Restrictions

The Public Use Restriction Plan is currently located external to this plan and can be found in the Fire Management Reference System.

D. Fire Danger Rating Area Development/Analysis

Ownership



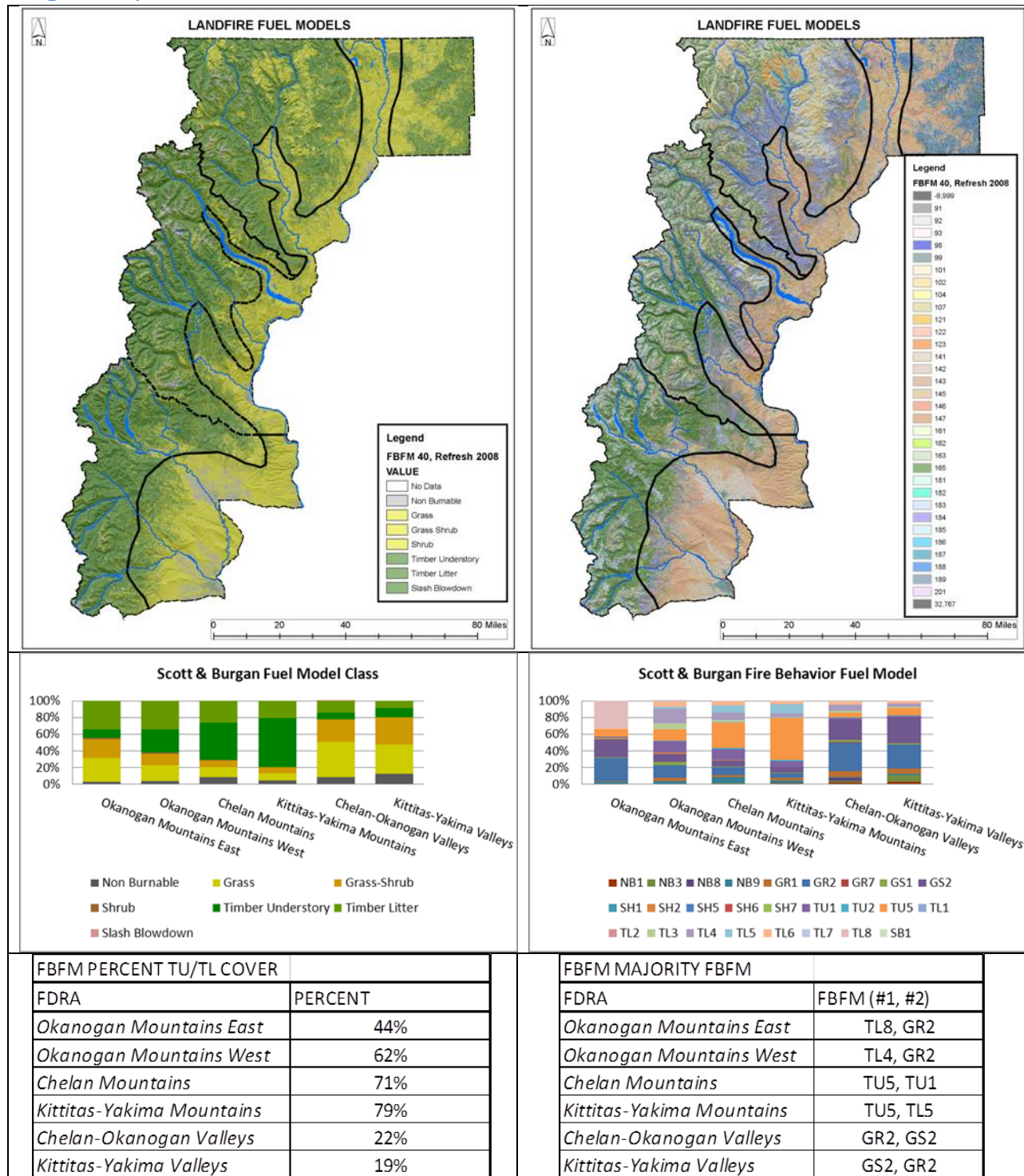
BLM LAND LINE INVENTORY PROPERTY STATUS ACRE TABULATION

FDRA	BLM	FWS	NPS	USFS	PV	ST	STF	STP	STW	SUM
<i>Okanogan Mountains East</i>	1,557	0	0	215,881	280,651	37,893	0	0	0	536,058
<i>Okanogan Mountains West</i>	11,671	2,866	226	1,215,675	101,694	190,678	0	107	10,869	1,534,946
<i>Chelan Mountains</i>	277	712	132,136	1,138,481	66,841	9,876	0	738	0	1,354,712
<i>Kittitas-Yakima Mountains</i>	148	0	56	847,630	221,365	106,329	0	615	0	1,176,535
<i>Chelan-Okanogan Valleys</i>	66,530	0	0	275,573	726,259	94,409	12,806	1,954	1,159	1,226,893
<i>Kittitas-Yakima Valleys</i>	20,707	0	0	88,175	636,368	201,161	0	4,712	52,921	1,005,927
SUM	100,890	3,578	132,418	3,781,416	2,033,178	640,347	12,806	8,125	64,949	6,835,070

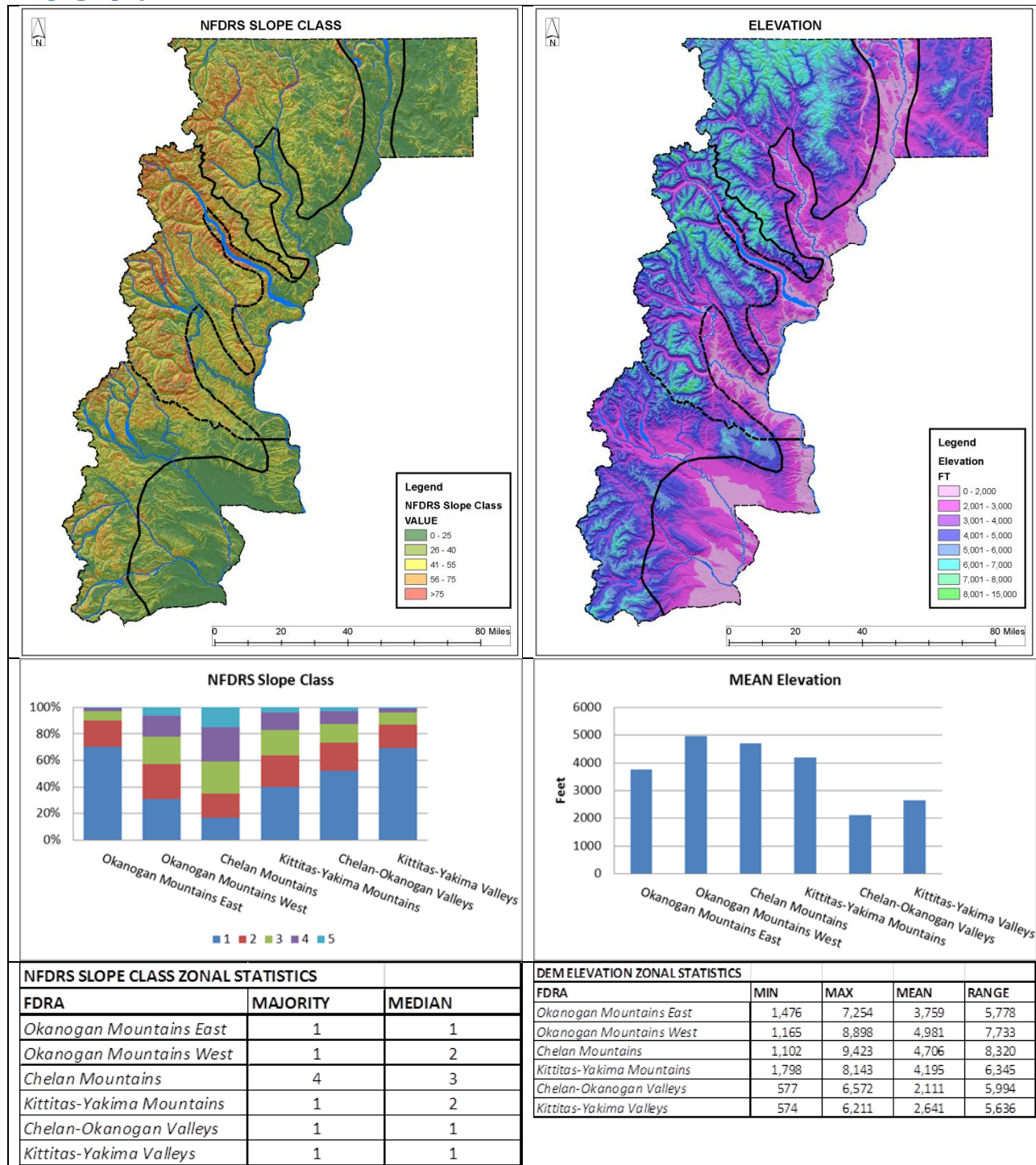
BLM LAND LINE INVENTORY FEDERAL STATUS ACRE TABULATION

FDRA	FEDERAL PROTECTION AC	OTHER PROTECTION AC	SUM	FEDERAL PROTECTION %	OTHER PROTECTION %
<i>Okanogan Mountains East</i>	217,514	318,544	536,058	41%	59%
<i>Okanogan Mountains West</i>	1,231,520	303,426	1,534,946	80%	20%
<i>Chelan Mountains</i>	1,268,693	86,018	1,354,712	94%	6%
<i>Kittitas-Yakima Mountains</i>	848,002	328,533	1,176,535	72%	28%
<i>Chelan-Okanogan Valleys</i>	346,733	880,160	1,226,893	28%	72%
<i>Kittitas-Yakima Valleys</i>	109,131	896,796	1,005,927	11%	89%
SUM	4,021,593	2,813,478	6,835,070	59%	41%

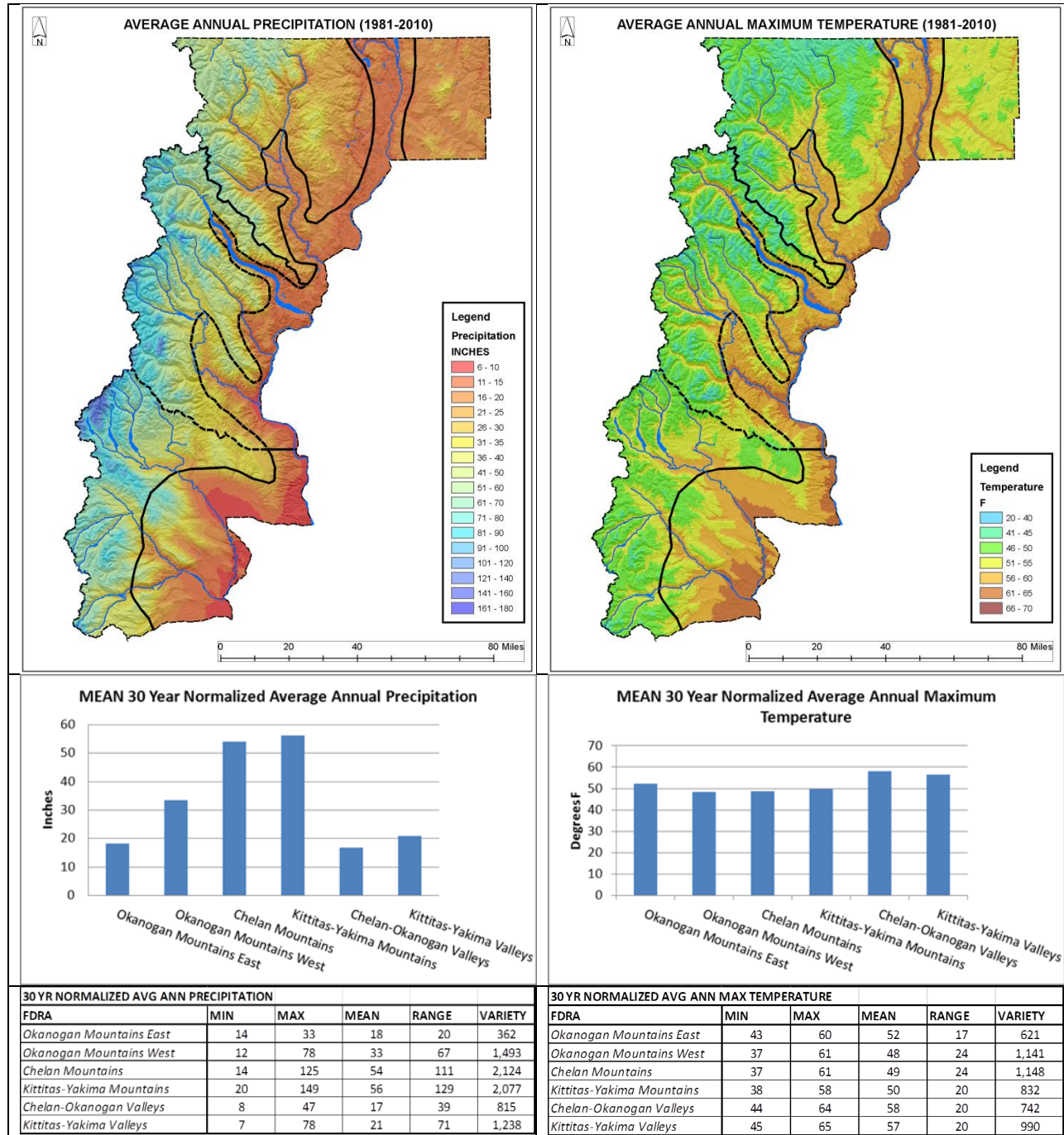
Vegetation/Fuels

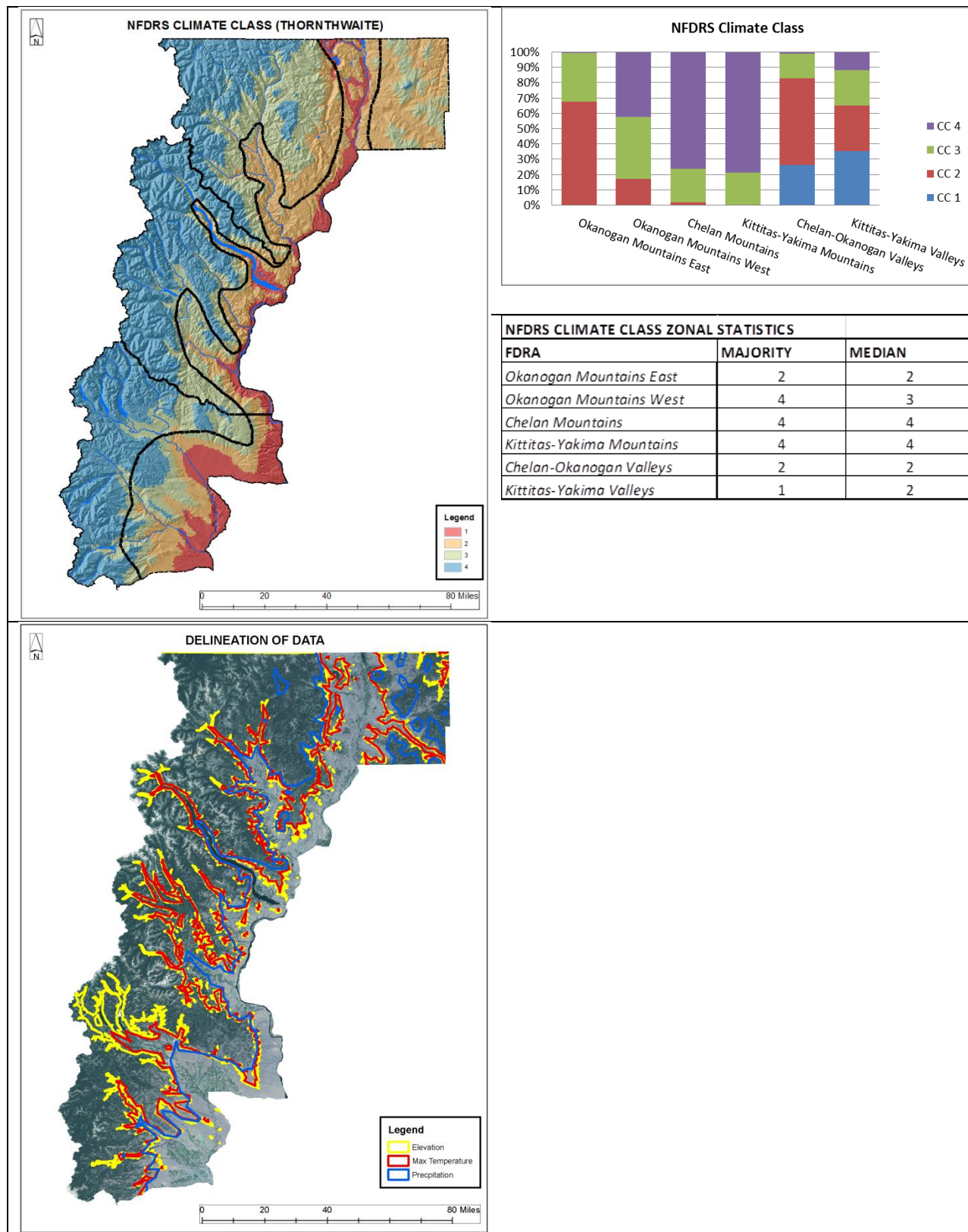


Topography



Climate





Special Interest Group 10 Year Average Daily 1-HR Time Lag Fuel Moistures (2002-2011)

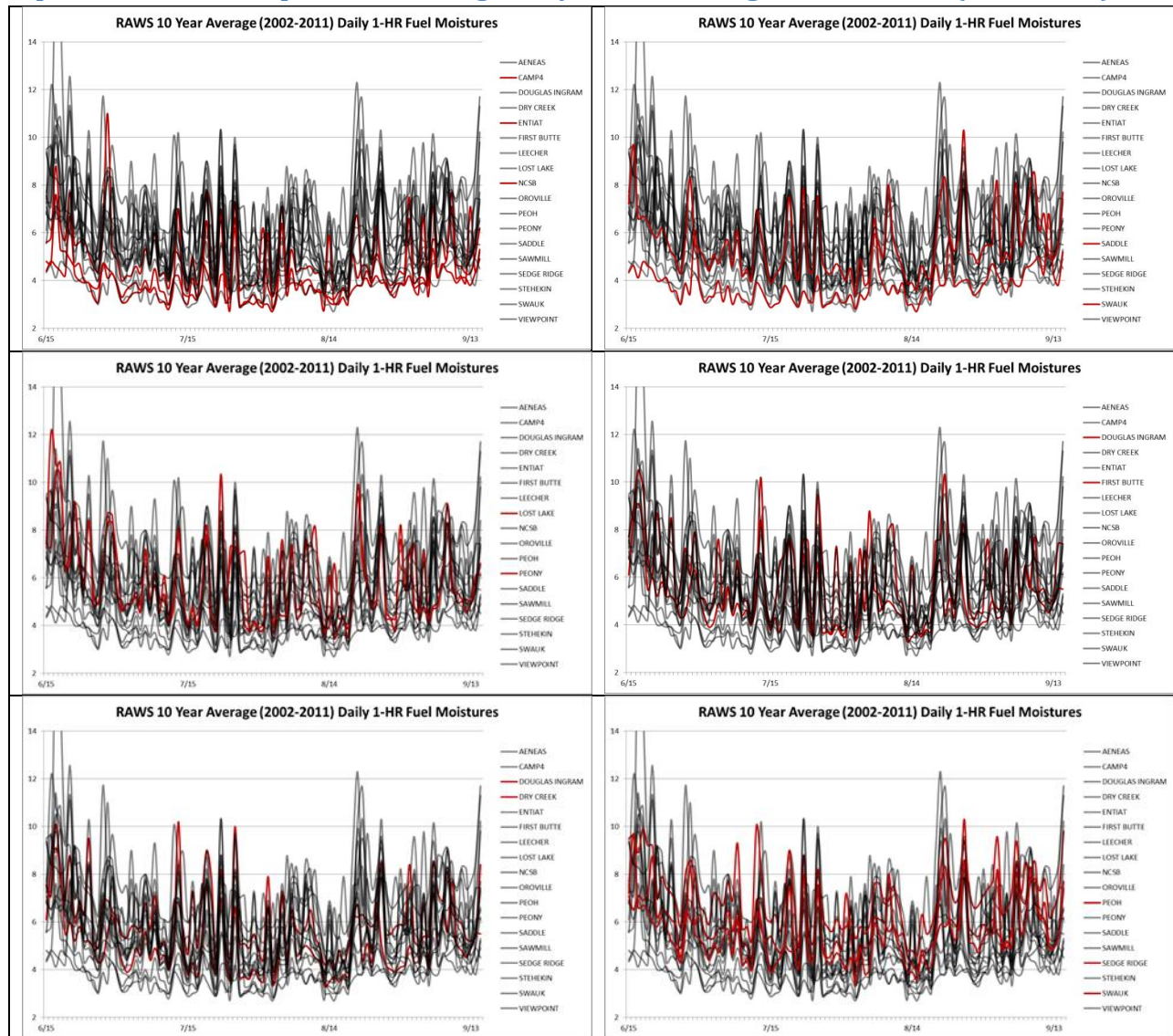
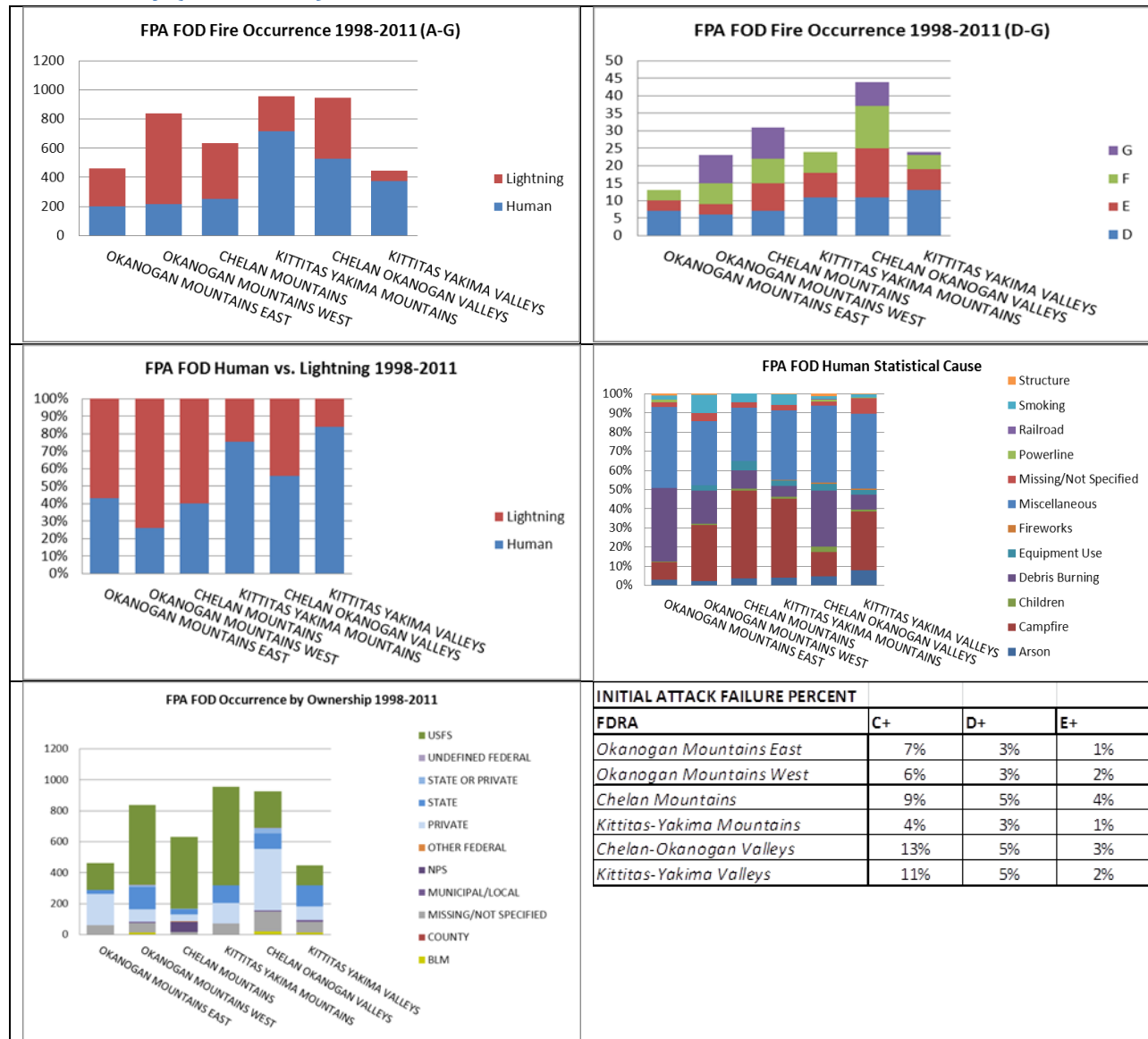
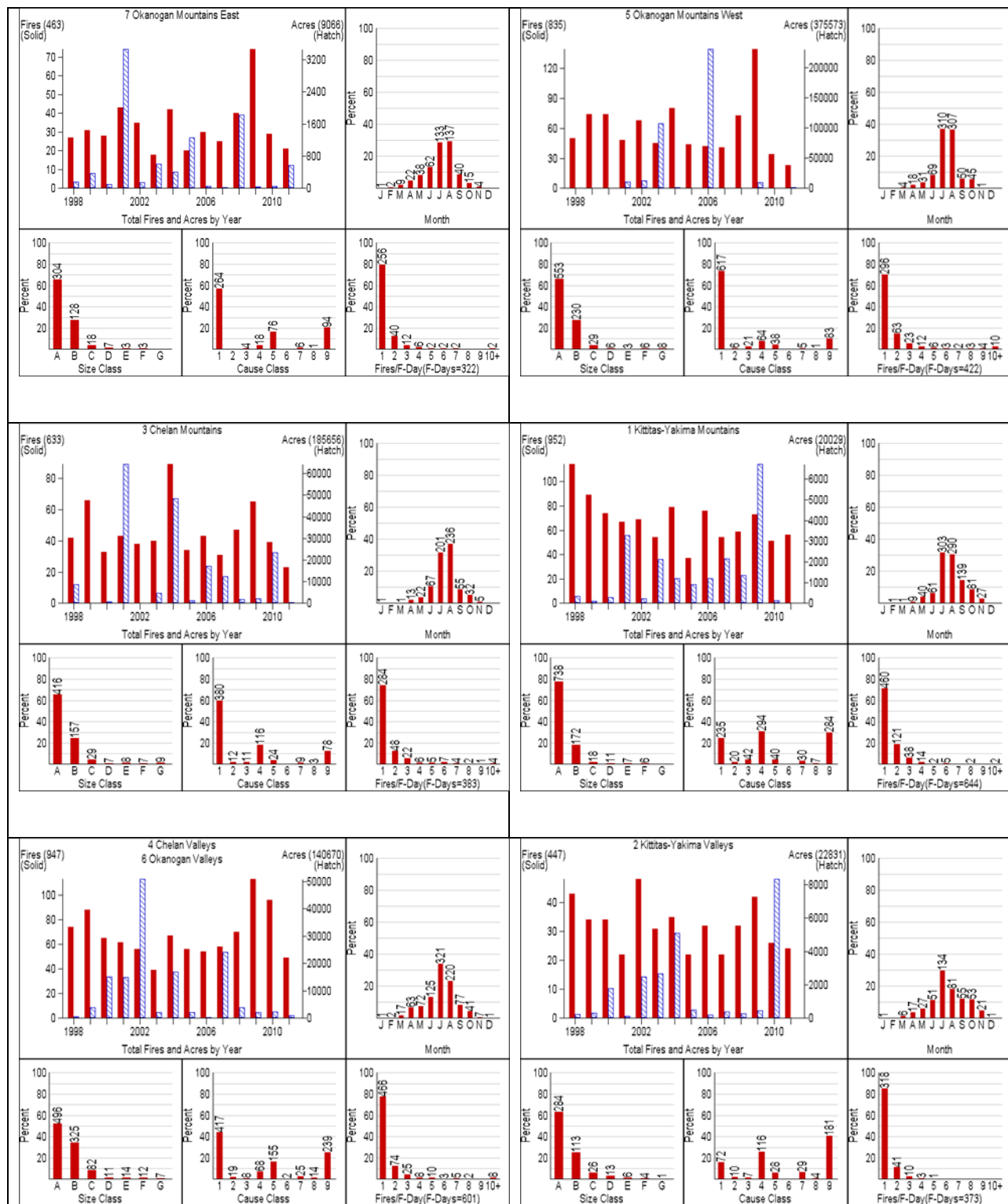


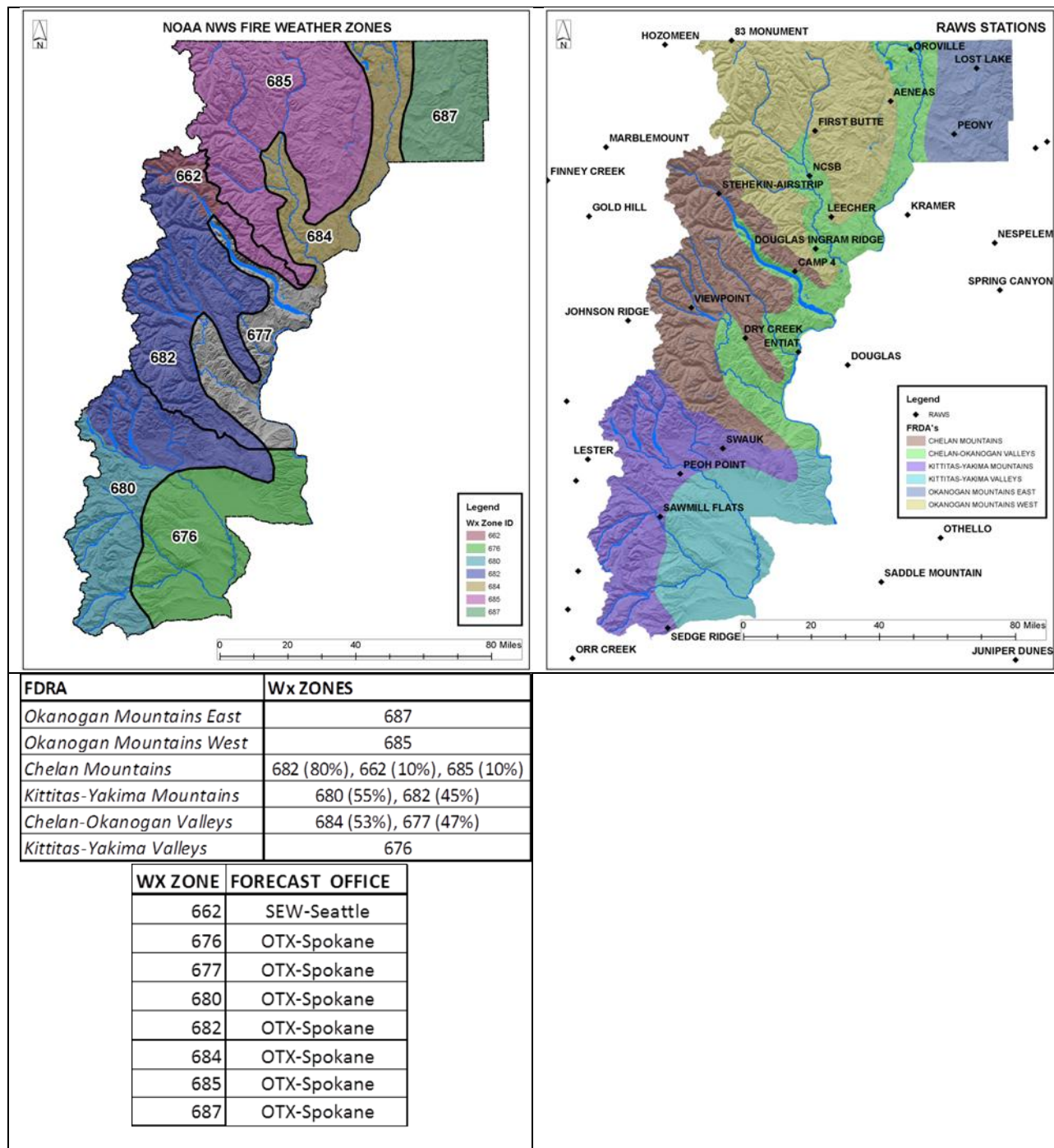
Figure 11: 10 year average daily 1-hr fuel moistures with Special Interest Group stations highlighted. From left to right; Chelan Okanogan Valleys, Kittitas Yakima Valleys, Okanogan Mountains East, Okanogan Mountains West, Chelan Mountains, Kittitas Yakima Mountains.

Fire History (1998-2011)





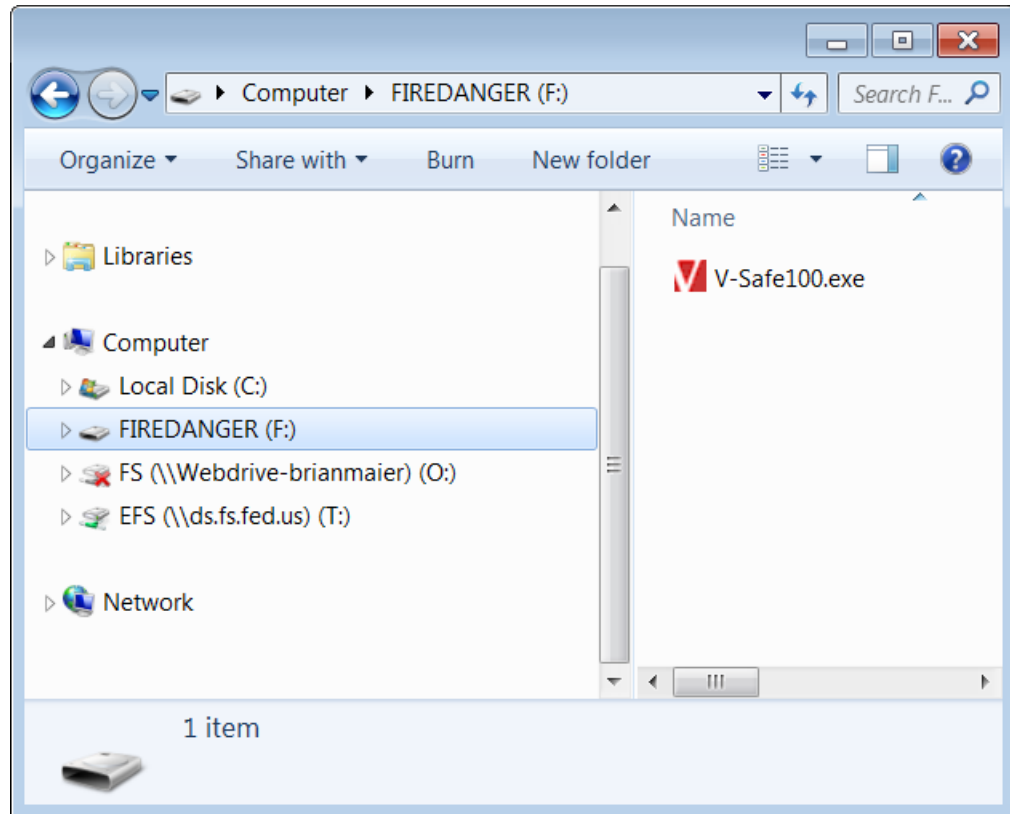
Weather Stations & Weather Zones



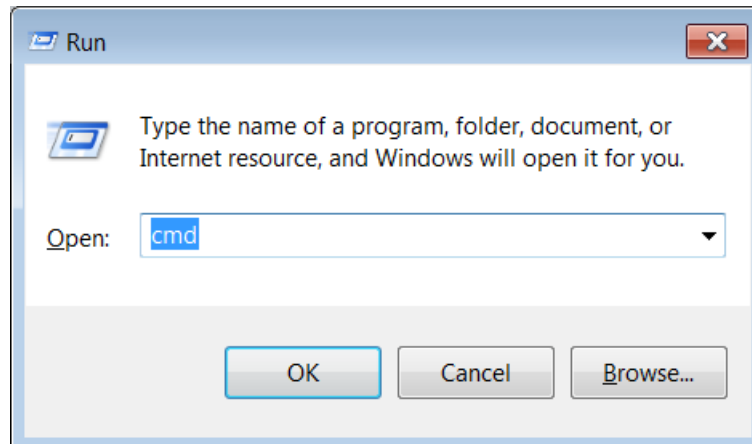
NWSID	NAME	ELEV	AGENCY	DATA	% COMPLETE (5/01-10/31)	FF+CatGU
452001	AENEAS	5161	S	1993-2013	60%	5-Jun
452006	FIRST BUTTE	5509	USFS	1993-2013	96%	6-Jun
452020	LEECHER	4991	USFS	1993-2013	103%	30-May
452029	LOST LAKE	3876	USFS	1993-2013	98%	25-May
452030	NCSB	1697	USFS	1993-2013	98%	2-May
452035	DOUGLAS INGRAM	3566	USFS	1995-2013	98%	30-May
452038	PEONY	3804	USFS	1993-2013	97%	13-Jun
452039	OROVILLE	1360	BLM	1993-2013	96%	1-May
452040	KRAMER	2720	BIA	1993-2013	94%	15-May
452121	STEHIKEN	1230	NPS	1993-2013	83%	15-Jun
452128	VIEWPONT	3760	USFS	1993-2013	82%	20-Jun
452132	CAMP4	3156	USFS	1993-2013	93%	9-May
452134	DRY CREEK	3661	USFS	1993-2013	96%	25-May
452136	ENTIAT	796	USFS	1998-2013	92%	2-May
452206	PEOH POINT	4020	S	1993-2013	91%	20-May
452219	SWAUK	3480	USFS	1993-2013	96%	12-Jun
452221	SAWMILL	3000	USFS	1993-2013	93%	22-Jun
452306	SEDGE RIDGE	4533	S	1993-2013	93%	25-May
452601	DOUGLAS	2530	BLM	1993-2013	97%	14-May
453201	JUNIPER	950	BLM	1993-2013	97%	15-Apr
452028	NESPELEM	1782	BIA	1993-2013	95%	1-May
452701	SADDLE	650	FWS	2002-2013	97%	4-Apr

E. Fire Danger Worksheet Instructions

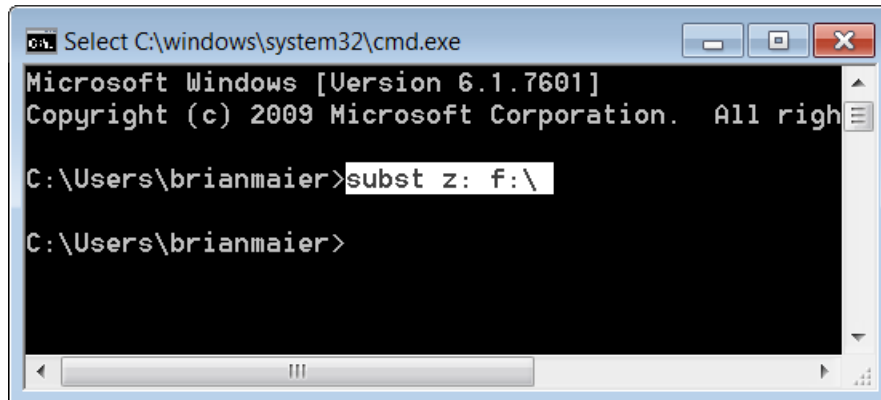
1. Insert FIREDANGER jump drive into a USB port
2. Perform a drive substitution (this allows the files to talk when moved between computers)
 - a. Open an Explorer window and note the letter of the drive where the jump drive is located. In this example F:



- b. Click Start and Run, type **cmd** and hit OK



- c. Type the following into the command line window (where f: is the location of the jump drive in your computer) **subst z: f:** and hit Enter

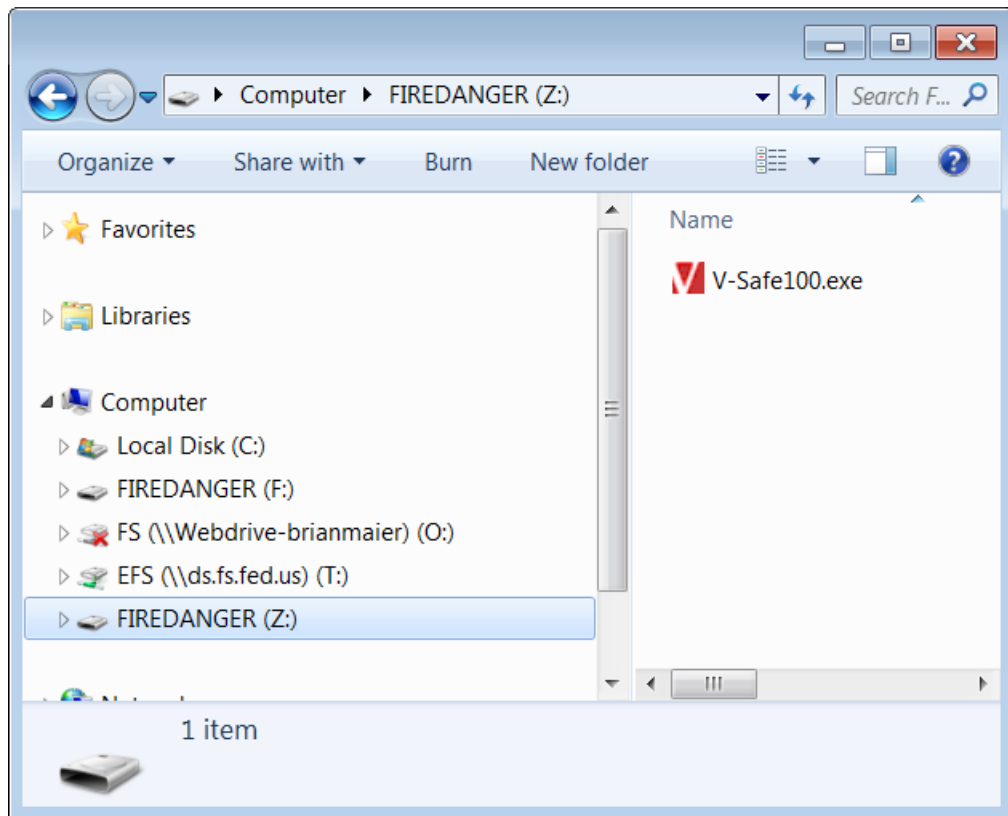


```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\brianmaier>subst z: f:\

C:\Users\brianmaier>
```

- d. Confirm that there is now a Virtual drive (Z:) on your computer



3. Open the FIREDANGER.xlsx file **from the Z drive**
4. On the Excel Data Tab, click Refresh All and wait for the data to refresh
5. Save and Close the FIREDANGER spreadsheet
6. Open the FIREDANGER.docx file **from the Z drive**, choose Yes when asked about updating information from linked files
7. **Save As** the FIREDANGER as file type **.pdf** using the following format (ex. FIREDANGER_20140530)
8. Save and Close the Word document